Biotechnology and Bioengineering

Volume 68, 2000

Volume 68, Number 1, April 5, 2000

1 Construction of Multicomponent Catalytic Films Based on Avidin-Biotin Technology for the Electroenzymatic Oxidation of Molecular Hydrogen
A.L. De Lacey, M. Detcheverry, J. Moiroux, and C. Bourdillon

11 Characterization Study of the Sporulation Kinetics of *Bacillus thuringiensis*
B.-L. Liu and Y.-M. Tzeng

18 Analysis and Prediction of the Effect of Uncertain Boundary Values in Modeling a Metabolic Pathway
P. de Atauri, A. Sorribas, and M. Cascante

31 Influence of Bcl-2 on Cell Death During the Cultivation of a Chinese Hamster Ovary Cell Line Expressing a Chimeric Antibody
B.T. Tey, R.P. Singh, L. Piredda, M. Piacentini, and M. Al-Rubeai

44 Efficient Bioconversion of Ethanol to Acetaldehyde Using a Novel Mutant Strain of the Methylotrophic Yeast *Hansenula polymorpha*
O.M. Moroz, M.V. Gonchar, and A.A. Sibirny

52 Suitability of Immobilized Metal Affinity Chromatography for Protein Purification from Canola
C.-M. Zhang, S.A. Reslewic, and C.E. Glatz

59 Cultivation of Immortalized Human Hepatocytes HepZ on Macroporous CultiSpher G Microcarriers
A. Werner, S. Duvar, J. Müthing, H. Büntemeyer, H. Lünsdorf, M. Strauss, and J. Lehmann

71 Kinetics of Cassava Starch Hydrolysis with Termamyl® Enzyme
D. Paolucci-Jeanjean, M.-P. Belleville, N. Zakhia, and G.M. Rios

78 Enzymatic Resolution of (*S*)-(+)-Naproxen in a Trapped Aqueous–Organic Solvent Biphase Continuous Reactor
J.-Y. Xin, S.-B. Li, Y. Xu, and L.-L. Wang

84 Lipase and Esterase-Catalyzed Acylation of Hetero-Substituted Nitrogen Nucleophiles in Water and Organic Solvents
M.A.P.J. Hacking, H. Akkus, F. van Rantwijk, and R.A. Sheldon

92 A Forced-Flow Membrane Reactor for Transfructosylation Using Ceramic Membrane
K. Nishizawa, M. Nakajima, and H. Nabetani

98 Reversible Enzyme Immobilization via a Very Strong and Nondistorting Ionic Adsorption on Support–Polyethylenimine Composites
C. Mateo, O. Abian, R. Fernandez-Lafuente, and J.M. Guisan

This Journal is Online
WILEY InterScience®
www.interscience.wiley.com

106 Three-Dimensional Engineered Heart Tissue from Neonatal Rat Cardiac Myocytes
W.H. Zimmermann, C. Fink, D. Kralisch, U. Remmers, J. Weil, and T. Eschenhagen

COMMUNICATIONS TO THE EDITOR

115 Development and Characterization of an Oxygen-Dependent Inducible Promoter System, the Modified *nar* Promoter in a Mutant *Escherichia coli*
S.J. Han, H.N. Chang, J.A. DeMoss, E.J. Suh, and J. Lee

121 Rapid In Vivo Evolution of a β-Lactamase Using Phagemids
J. Long-McGie, A.D. Liu, and V. Schellenberger

126 Forthcoming Articles

Volume 68, Number 2, April 20, 2000

127 Mathematical Modeling as a Tool to Investigate the Design and Operation of the Zymotis Packed-Bed Bioreactor for Solid-State Fermentation
D.A. Mitchell and O.F. von Meien

136 Production of Sm37-GAPDH, a Major Therapeutical Target in Human Schistosomiasis
L. Argiro, C. Doerig, S. Liabeuf, A. Bourgois, and J.L. Romette

142 Bioartificial Kidney. I. Theoretical Analysis of Convective Flow in Hollow Fiber Modules: Application to a Bioartificial Hemofilter
Y. Moussy

153 Bioartificial Kidney. II. A Convective Flow Model of a Hollow Fiber Bioartificial Renal Tubule
Y. Moussy

160 Effect of Biomass Concentration and Mycelial Morphology on Fermentation Broth Rheology
G.L. Riley, K.G. Tucker, G.C. Paul, and C.R. Thomas

173 Modeling of Eicosapentaenoic Acid (EPA) Production from *Phaeodactylum tricornutum* Cultures in Tubular Photobioreactors. Effects of Dilution Rate, Tube Diameter, and Solar Irradiance
F.G. Acién Fernández, J.A. Sánchez Pérez, J.M. Fernández Sevilla, F. García Camacho, and E. Molina Grima

184 Preparation of *Thermus thermophilus* Holo-chaperonin-Immobilized Microspheres with High Ability to Facilitate Protein Refolding
T. Teshima, J. Kohda, A. Kondo, H. Taguchi, M. Yohda, and H. Fukuda

191 Purification of Lysozyme Using Ultrafiltration
R. Ghosh and Z.F. Cui

204 Effect of Substrate and Cellulase Concentration on Simultaneous Saccharification and Fermentation of Steam-Pretreated Softwood for Ethanol Production
K. Stenberg, M. Bollók, K. Réczey, M. Galbe, and G. Zacchi

211 Directed Evolution of a Novel *N*-Carbamylase/D-Hydantoinase Fusion Enzyme for Functional Expression with Enhanced Stability
G.J. Kim, Y.H. Cheon, and H.-S. Kim

218 Synthesis of Bioprocesses Using Physical Properties Data
M.A. Steffens, E.S. Fraga, and I.D.L. Bogle

COMMUNICATION TO THE EDITOR

231 Characterization of Kinetics and Thermostability of *Acremonium strictum* Glucooligosaccharide Oxidase
Z. Fan, G.B. Oguntimein, P.J. Reilly

238 Forthcoming Articles

Volume 68, Number 3, May 5, 2000

ACCELERATED PUBLICATION

239 Engineering of Coordinated Up- and Down-Regulation of Two Glycosyltransferases of the O-Glycosylation Pathway in Chinese Hamster Ovary (CHO) Cells
E.G.P. Prati, M. Matasci, T.B. Suter, A. Dinter, A.R. Sburlati, and J.E. Bailey

ARTICLES

245 Growth-Rate-Independent Production of Recombinant Glucoamylase by *Fusarium venenatum* JeRS 325
M.G. Wiebe, G.D. Robson, J. Shuster, and A.P.J. Trinci

252 Physiological Studies in Aerobic Batch Cultivations of *Saccharomyces cerevisiae* Strains Harboring the *MEL1* Gene
S. Ostergaard, C. Roca, B. Rønnow, J. Nielsen, and L. Olsson

260 Hyperosmotic Pressure Enhances Immunoglobulin Transcription Rates and Secretion Rates of KR12H-2 Transfectoma
M.S. Lee and G.M. Lee

269 Modeling and Optimization of Anaerobic Digested Sludge Converting Starch to Hydrogen
J.-J. Lay

279 Influence of High Biomass Concentrations on Alkane Solubilities
B.H. Davison, J.W. Barton, K.T. Klasson, and A.B. Francisco

285 Dynamic Biochemical Reaction Process Analysis and Pathway Modification Predictions
R. Conejeros and V.S. Vassiliadis

298 Design of Metabolic Feed Controllers: Application to High-Density Fermentations of *Pichia pastoris*
J.D. Chung

308 A Material-Balance Approach for Modeling Bacterial Chemotaxis to a Consumable Substrate in the Capillary Assay
R.B. Marx and M.D. Aitken

316 Investigation of the TCA Cycle and the Glyoxylate Shunt in *Escherichia coli* BL21 and JM109 Using ^{13}C-NMR/MS
S.B. Noronha, H.J.C. Yeh, T.F. Spande, and J. Shiloach

328 Culture of Human T Cells in Stirred Bioreactors for Cellular Immunotherapy Applications: Shear, Proliferation, and the IL-2 Receptor
K.S. Carswell and E.T. Papoutsakis

339 Structural Stability of DNA in Nonaqueous Solvents
G. Bonner and A.M. Klibanov

COMMUNICATION TO THE EDITOR

345 Bacterial Cellulose Production by *Acetobacter xylinum* in a 50-L Internal-Loop Airlift Reactor
Y. Chao, T. Ishida, Y. Sugano, and M. Shoda

353 Forthcoming Articles

Volume 68, Number 4, May 20, 2000

355 A Theoretical Study on the Effect of Surface Roughness on Mass Transport and Transformation in Biofilms
C. Picioreanu, M.C.M. van Loosdrecht, and J.J. Heijnen

370 Effects of Ammonia on CHO Cell Growth, Erythropoietin Production, and Glycosylation
M. Yang and M. Butler

381 Enhanced Growth of Sf-9 Cells to a Maximum Density of 5.2×10^7 Cells per mL and Production of β-Galactosidase at High Cell Density by Fed Batch Culture
C.B. Elias, A. Zeiser, C. Bédard, and A.A. Kamen

389 Glutathione Excretion in Response to Heterologous Protein Secretion in *Saccharomyces cerevisiae*
S.J. Bannister and K.D. Wittrup

396 Single-Step Nitrification Models Erroneously Describe Batch Ammonia Oxidation Profiles when Nitrite Oxidation Becomes Rate Limiting
K. Chandran and B.F. Smets

407 Modification of a Recombinant GPI-Anchored Metalloproteinase for Secretion Alters the Protein Glycosylation
C.J. Morrison, R.L. Easton, H.R. Morris, W.R. McMaster, J.M. Piret, and A. Dell

422 Endogenous Model State and Parameter Estimation from an Extensive Batch Experiment
K.J. Keesman and H. Spanjers

430 Stabilization of D-Amino Acid Oxidase and Catalase in Permeabilized *Rhodotorula gracilis* Cells and Its Application for the Preparation of α-Ketoacids
R. Upadhya, Nagajyothi, and S.G. Bhat

437 Growth Kinetics of *Pseudomonas putida* in Cometabolism of Phenol and 4-Chlorophenol in the Presence of a Conventional Carbon Source
S.-J. Wang and K.-C. Loh

448 Influence of Mixing and Water Addition on the Removal Rate of Toluene Vapors in a Biofilter
R. Auria, G. Frere, M. Morales, M.E. Acuña, and S. Revah

456 Modeling Biofilm Antimicrobial Resistance
M.G. Dodds, K.J. Grobe, and P.S. Stewart

COMMUNICATION TO THE EDITOR

466 Production of Medium-Chain-Length Polyhydroxyalkanoates by High-Cell-Density Cultivation of *Pseudomonas putida* Under Phosphorus Limitation
S.Y. Lee, H.H. Wong, J.-i. Choi, S.H. Lee, S.C. Lee, and C.S. Han

471 Forthcoming Articles

Volume 68, Number 5, June 5, 2000

ACCELERATED PUBLICATION

473 ATR-FTIR Sensor Development for Continuous On-Line Monitoring of Chlorinated Aliphatic Hydrocarbons in a Fixed-Bed Bioreactor
V. Acha, M. Meurens, H. Naveau, and S.N. Agathos

ARTICLES

488 Preparation, Morphological Characterization, and Activity of Thin Films of Horseradish Peroxidase
F. Vianello, L. Zennaro, M.L. Di Paolo, A. Rigo, C. Malacarne, and M. Scarpa

496 Stoichiometry and Kinetics of Poly-β-Hydroxybutyrate Metabolism Under Denitrifying Conditions in Activated Sludge Cultures
J.J. Beun, E.V. Verhoef, M.C.M. Van Loosdrecht, and J.J. Heijnen

508 Effect of Vapor-Phase Bioreactor Operation on Biomass Accumulation, Distribution, and Activity: Linking Biofilm Properties to Bioreactor Performance
J. Song and K.A. Kinney

517 Fermentative Capacity in High-Cell-Density Fed-Batch Cultures of Baker's Yeast
P. van Hoek, E. de Hulster, J.P. van Dijken, and J.T. Pronk

524 Effect of Alcohol Compounds Found in Hemicellulose Hydrolysate on the Growth and Fermentation of Ethanologenic *Escherichia coli*
J. Zaldivar, A. Martinez, and L.O. Ingram

531 Isolation of Thermotolerant Ethanologenic Yeasts and Use of Selected Strains in Industrial Scale Fermentation in an Egyptian Distillery
W.R. Abdel-Fattah, M. Fadil, P. Nigam, and I.M. Banat

536 A Microscale Model of Bacterial and Biofilm Dynamics in Porous Media
R. Dillon and L. Fauci

548 A Hollow-Fiber Membrane Bioreactor for the Removal of Trichloroethylene from the Vapor Phase
J.G. Pressman, G. Georgiou, and G.E. Speitel, Jr.

557 Production of Recombinant L-Leucine Dehydrogenase from *Bacillus cereus* in Pilot Scale Using the Runaway Replication System *E. coli*[pIET98]
M.B. Ansorge and M.-R. Kula

563 Continuous Enzymatic Esterification of Glycerol with (Poly)Unsaturated Fatty Acids in a Packed-Bed Reactor
J.A. Arcos, H.S. Garcia, and C.G. Hill, Jr.

571 Use of Anion Exchange Resin-Packed Capillary Column for Rapid Detection of Anti-Double-Stranded DNA Antibody in Systemic Lupus Erythematosus Serum
T.-k. Lim, N. Nakamura, and T. Matsunaga

576 Purification of a Cystic Fibrosis Plasmid Vector for Gene Therapy Using Hydrophobic Interaction Chromatography
M.M. Diogo, J.A. Queiroz, G.A. Monteiro, S.A.M. Martins, G.N.M. Ferreira, and D.M.F. Prazeres

COMMUNICATION TO THE EDITOR

584 Contamination of a High-Cell Density Continuous Bioreactor
L. Domingues, N. Lima, and J.A. Teixeira

588 Forthcoming Articles

Volume 68, Number 6, June 20, 2000

589 Power Consumption in Shaking Flasks on Rotary Shaking Machines: I. Power Consumption Measurement in Unbaffled Flasks at Low Liquid Viscosity
J. Büchs, U. Maier, C. Milbradt, and B. Zoels

594 Power Consumption in Shaking Flasks on Rotary Shaking Machines: II. Nondimensional Description of Specific Power Consumption and Flow Regimes in Unbaffled Flasks at Elevated Liquid Viscosity
J. Büchs, U. Maier, C. Milbradt, and B. Zoels

602 Application of Metabolic Flux Analysis for the Indentification of Metabolic Bottlenecks in the Biosynthesis of Penicillin-G
W.M. van Gulik, W.T.A.M. de Laat, J.L. Vinke, and J.J. Heijnen

619 Two-Phase Model of the Kinetics of Growth of *Rhizopus oligosporus* in Membrane Culture
L. Ikasari and D.A. Mitchell

628 Novel Experimental Study of Receptor-Mediated Bacterial Adhesion Under the Influence of Fluid Shear
N. Mohamed, T.R. Rainier, Jr., and J.M. Ross

637 Ammonium Alters N-Glycan Structures of Recombinant TNFR-IgG: Degradative Versus Biosynthetic Mechanisms
M. Gawlitzek, T. Ryll, J. Lofgren, and M.B. Sliwkowski

647 Microaerobic Hydrogen Production by Photosynthetic Bacteria in a Double-Phase Photobioreactor
T. Matsunaga, T. Hatano, A. Yamada, and M. Matsumoto

652 Metabolic Network Analysis of *Penicillium chrysogenum* Using ^{13}C-Labeled Glucose
B. Christensen and J. Nielsen

660 Hydrolysis of Glucosinolates Using Nylon-Immobilized Myrosinase to Produce Pure Bioactive Molecules
O. Leoni, R. Iori, and S. Palmieri

665 Investigating the Effects of Polymer Chemistry on Activity of Biocatalytic Plastic Materials
S.J. Novick and J.S. Dordick

672 Hydrophobic Displacement Chromatography of Proteins
A.A. Shukla, K.M. Sunasara, R.G. Rupp, and S.M. Cramer

681 A Vortex-Bowl Disk Atomizer System for the Production of Alginate Beads in a 1500-Liter Fermentor
C.P. Champagne, N. Blahuta, F. Brion, and C. Gagnon

689 Exploiting Viral Cell-Targeting Abilities in a Single Polypeptide, Non-Infectious, Recombinant Vehicle for Integrin-Mediated DNA Delivery and Gene Expression
A. Arís, J.X. Feliu, A. Knight, C. Coutelle, and A. Villaverde

COMMUNICATION TO THE EDITOR

697 Observations on the Shear Damage to Different Animal Cells in a Concentric Cylinder Viscometer
S.H. Mardikar and K. Niranjan

705 Erratum

706 Forthcoming Articles

707 Index to Volume 68